

## Case Report

# Mushroom poisoning with *Scleroderma albidum*: a case report with review of the literature

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**Background:** Sclerodermataceae are known to be poisonous mushrooms; current published reports regarding the toxicity and treatment for Sclerodermataceae poisoning are limited.

**Case Presentation:** A 66-year-old man was transferred to our hospital with complaints of visual disturbance, lightheadedness, bradycardia, and shock. The patient's medical history included cerebral hemorrhage and alcoholic hepatitis. He had eaten a mushroom growing in his garden, 30 min before arriving at our hospital. We carried out gastric lavage and gave the patient activated charcoal within an hour of mushroom ingestion. Particles of the mushroom were obtained during lavage, and most complaints were relieved immediately. However, the patient remained in shock for <2 h. He was admitted for observation and discharged 2 days later with no complications. The Public Health and Welfare Office later identified the mushroom as *Scleroderma albidum*.

**Conclusion:** *Scleroderma albidum* caused muscarinic effects; features of central nervous system toxicity were also apparent.

**Key words:** Case report, central nervous system, muscarinic agonist, mushroom poisoning, shock

## INTRODUCTION

ALTHOUGH SCLERODERMATACEAE ARE known to be poisonous mushrooms, evidence regarding their toxicity, and suitable treatment for poisoning, is limited. One case report from Japan described vomiting, diarrhea, and abdominal pain in a patient who had eaten another mushroom from the Sclerodermataceae family, namely, *Scleroderma aurantium*.<sup>1</sup>

To our knowledge, this is the first case report of a muscarinic reaction following *Scleroderma albidum* consumption.

## CASE

A 66-YEAR-OLD MAN with a medical history of cerebral hemorrhage and alcoholic hepatitis picked a mushroom growing in his garden, sliced it, fried it in oil,

and ate nearly the whole of it. He suddenly lost consciousness 10 min later. He was discovered by his wife, who called the emergency medical service (EMS). She had also eaten a piece of the mushroom, but had experienced no symptoms. On arrival, the EMS found him seated on a chair in his house; he demonstrated sweating and pallor. Examination revealed a Glasgow Coma Scale score of 15 (E4V5M6), bilateral round and equal (2.5 mm) pupils, bilateral prompt light reflexes, a respiratory rate of 20 breaths/min, O<sub>2</sub> saturation of 94% on room air, heart rate of 59 b.p.m., blood pressure of 73/46 mmHg, and a body temperature of 36.0°C. During transfer to our hospital, the patient complained of visual disturbances on the right side (purple hue) and pain in the right leg. In accordance with the instructions from the medical control doctor, the EMS crew initiated fluid resuscitation. On arrival at our hospital, examination revealed: a Glasgow Coma Scale score of 15, bilateral round and equal (2.5 mm) pupils, bilateral prompt light reflexes, a respiratory rate of 24 breaths/min, heart rate of 52 b.p.m., blood pressure of 53/42 mmHg, and an O<sub>2</sub> saturation of 94% (O<sub>2</sub> 2 L/min, nasal cannula). The patient had brought the mushroom he had consumed with him (Fig. 1); it was approximately 2 cm in size. The patient stated that he had identified it as *Rhizopogon roseolus*, which is edible. Therefore, we searched for poisonous mushrooms with a

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similar shape and suspected that he might have eaten a mushroom of the Sclerodermataceae family. According to the standard treatment for poisoning, we undertook immediate gastric lavage with 1 L of warm water, 30 min after ingestion. The patient had vomited once before gastric lavage. A large amount of small black granules, resembling black pepper, drained through the nasogastric tube. These were presumed to be fungal spores. Activated charcoal was given after gastric lavage. Following treatment, his heart rate immediately recovered to 80 b.p.m., and the visual abnormality and pain in the leg had ceased. The patient's systolic blood pressure went up to 118 mm Hg, 90 min after arriving our hospital. He had no further complaints, and laboratory tests did not indicate organ dysfunction (Table 1). Low blood pressure and bradycardia did not recur, and he was discharged 3 days after admission. Following notification of this case, the Public Health and Welfare Office identified the ingested mushroom as *Scleroderma albidum*, which belongs to the Sclerodermataceae family.

## DISCUSSION

**T**HIS REPORT DESCRIBES a case of mushroom poisoning with *S. albidum*. The Ministry of Health, Labor and Welfare in Japan had reported three cases of Sclerodermataceae poisoning, including an earlier case in 2008.<sup>1</sup> The symptoms, according to this report, were severe abdominal pain, vomiting, and diarrhea. Another similar case of mushroom poisoning was reported approximately 50 years ago, but details of the case could not be retrieved.<sup>2</sup> The findings indicate that this poisoning is either rare or non-lethal. In our



**Fig. 1.** Photograph of a similar mushroom taken by the patient in his garden.

case, the patient vomited once after arriving at hospital, but the main complaints were not related to digestive symptoms. Although the occurrence of shock in our case could be explained by muscarinic effects from the mushroom, visual disturbance and leg pain are not compatible with these effects, and have not been described in the previous report. The symptoms might have resulted from central nervous system toxicity, or could have been related to a previous cerebral hemorrhage in the left occipital lobe. Several differential diagnoses were considered. The absence of skin rashes, respiratory symptoms, or other symptoms of anaphylaxis, except for shock, excluded an allergic reaction. Bradycardia was also not compatible with anaphylaxis. Cardiovascular events were excluded by chest X-ray, electrocardiogram, and echocardiogram. Neurogenic shock was excluded in view of the absence of recent injuries. Dehydration was also excluded by the history and blood test results (Table 1).

A standard treatment protocol has not been established owing to insufficient evidence in published reports. In our case, immediate gastric lavage and activated charcoal was effective. This suggests that standard early emergency procedures for suspected poisoning are valid in mushroom poisoning.

A regional poison control center, namely, the Public Health and Welfare Center, provided valuable information

**Table 1.** Laboratory test results on admission of a 66-year-old man who had ingested *Scleroderma albidum*

Serum chemistry			
BUN	16 mg/dL	CRP	0.08 mg/dL
Cr	0.96 mg/dL	Glucose	157 mg/dL
Total protein	6.2 g/dL	Total bilirubin	1.2 mg/dL
Albumin	4.0 g/dL	LDH	165 IU/L
AST	25 IU/L	$\gamma$ -GTP	80 IU/L
ALT	20 IU/L	CK	122 IU/L
Blood gas analysis (O <sub>2</sub> 2L/min nasal cannula)		Complete blood cell count	
pH	7.353	WBC	6,600/ $\mu$ L
pO <sub>2</sub>	123.0 mmHg	Hb	14.5 g/dL
pCO <sub>2</sub>	39.2 mmHg	Hct	40.2%
Base excess	-3.5 mmol/L	Plt	19.9 $\times$ 10 <sup>4</sup> / $\mu$ L
HCO <sub>3</sub> <sup>-</sup>	21.8 mmol/L	Blood coagulation system	
Lactate	3.8 mmol/L	APTT	23.7 s
		PT-INR	1.08

$\gamma$ -GTP,  $\gamma$ -glutamyl transferase; ALT, alanine aminotransferase; APTT, activated partial thromboplastin time; AST, aspartate aminotransferase; BUN, blood urea nitrogen; CK, creatine kinase; Cr, creatinine; CRP, C-reactive protein; Hb, hemoglobin; Hct, hematocrit; LDH, lactate dehydrogenase; Plt, platelets; PT-INR, prothrombin time – international normalized ratio; WBC, white blood cells.

regarding the identification of this poisonous mushroom. Although the identification process took several days and was not immediate, it was very helpful for the definitive care and diagnosis. The mushroom was morphologically identified based on its characteristics, which included the more or less smooth, pale brown surface of the fruit body, a thick (approximately 1 mm) peridium that turned reddish when rubbed or bruised, and large basidiospores with spiny ornaments (10–14 µm in diameter, excluding the ornaments), corresponding to the characteristics of *S. albidum*.<sup>3,4</sup>

The findings of this study are limited by the inability to analyze the poisonous substance in the mushroom. Reports suggest that *S. citrinum*, one of the Sclerodermataceae, contains sclerocitrin.<sup>5</sup> However, the biological activity of sclerocitrin is unclear. The patient's wife probably had no symptoms as she had eaten only two or three slices, as opposed to her husband, who ate almost the whole mushroom. Therefore, it appears that the quantity of ingestion might relate to the degree of poisoning. To the best of our knowledge, the poisonous substance of *S. albidum* is also unknown, and should be evaluated in future studies.

## CONCLUSION

**M**USHROOM POISONING WITH *S. albidum* produces muscarinic effects and probable central nervous system toxicity. Immediate gastric lavage and activated charcoal administration could be an effective treatment. Cumulative evidence from reports of mushroom poisoning will facilitate development of treatment strategies for future cases.

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## DISCLOSURE

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Registry and the registration no. of the study/trial: N/A.

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Conflict of interest: None declared.

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